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B P I S A E

RESEARCH ACTIVITIES

PLEASE CIRCULATE TO ALL INTERESTED EMPLOYEES OF THE BUREAU

PLANT INDUSTRY STATION, BELTSVILLE, MD.

MARCH 1950

FOR ADMINISTRATIVE USE ONLY

Renewed Attack on Oak Wilt

The wilt disease of oaks, in the news this past month, has been known to Bureau forest pathologists for many years. They had a part in the cooperative research in Wisconsin where the fungus causing the disease was described and named Chalara quercina in 1944.

The recent apparent spread of oak wilt to commercial timber areas in Indiana, Illinois, and Missouri has aroused renewed efforts to find the fungus carrier. A third of the hardwood saw timber in the East is oak.

A relative of the beetle-carried fungus that causes Dutch elm disease, Chalara quercina develops more rapidly on red and black oaks than on the white. Most oaks of the eastern United States, however, are susceptible to the wilt.

In red oaks, the disease first appears in the upper crown. The leaves become a dull light green, curl upward, and before falling may turn yellow to reddish brown. All leaves may fall within a month from the first appearance of symptoms. Trees may die within a year. Sucker growth, which often appears on the trunk or branches of wilt-infected trees, also soon succumbs.

On red and black oaks the wilt kills the stump and roots. The fungus spores may survive two years in stumps.

In white and bur oaks, symptoms may show up on one or more branches in any part of the top of the tree. Leaves or parts of them turn tan to brown or dark green and may appear to be watersoaked. Although wilt does not spread so rapidly in these oaks, it kills them.

The disease spreads through wound infections. It can also go from tree to tree through natural root grafts. But this underground route does not explain the jumps of the disease from locality to locality. This is one of the most important of the factors to be solved as a preliminary to wilt control.

Quotes from USDA Graduate School Seminars at Beltsville

The job of administering agricultural research, said Dr. P. V. Cardon, administrator of ARA, requires constant attention to the inter-relationships of numerous factors not easily controlled and subject to continuous change.

"To visualize what this means, I think of the soil on my dining table... soil from widely scattered places converted by magical processes into the things I eat. In buying food, I buy not only the tangible things like soil, water, nutrients, and conditioners...but also the intangible know-how derived from man's age-long struggle to produce food and from the enlightenment resulting from research. I see the relation of soil science to genetics, pathology, entomology, animal husbandry, farm management, marketing, utilization, nutrition, and other areas of specialized interest. I thereby gain a clearer appreciation of what the job of administering research entails.

"The mechanism of my watch helps me visualize a smooth-working, effective organization of the numerous and complex activities of agricultural research. Each part is as nearly perfect as man's ingenuity can make it, yet no part can keep time by itself. The watch will not keep time if any part fails to function effectively. To develop an objective appreciation of inter-relationships is the essence of the administrative job."

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Discussing "Your Department and You," T. Roy Reed, director of personnel, said there is a tendency on the part of the public to think each employee should know something about every phase of the Department's work. The tremendous scope of this work is indicated by the 1950 appropriation of about 1-1/3 billion. Only about 23 percent of these funds, however, will be spent in the Department for salaries, equipment, and related items. The remainder is earmarked by law for definite purposes, mostly for loans and payments to states.

The number of USDA employees has declined steadily since the peak of 1938. A few additions will be made this year to assist in new functions under the rural housing and telephone acts. Agriculture offers a greater variety of positions than any other Department. In addition to full-time employees, the Department has the cooperation and part-time assistance of practical farmers and business men on county, state, and national advisory committees.

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Factors in the economic environment that will influence agriculture during the next few years were outlined by O. V. Wells, chief of the Bureau of Agricultural Economics, as follows:

The drop in farm income from the post-war peak of 18 billion dollars to about 12 billion dollars this year is largely the result of a dwindling export market. There is little prospect that this market will be revived. We are now paying for our exports ourselves through ECA appropriations. The best prospect for stabilizing farm income lies in the maintenance of high employment throughout the nation. This creates a demand for farm products. By 1975 the population of the United States will probably be about 175 million people.

Accumulations of Organic Insecticides Injure Seedlings and Cover Crops

A sharp decline in the power of experimental peach orchard soils to produce certain cover crops where DDT, BHC, and other organic chemicals have accumulated is reported by M. C. Goldsworthy and A. C. Foster (F&VC&D).

Exploring the possibilities of orchard soil pollution by accumulations of some of the new organics used for insect control, they think the chief hazards are to certain cover crops and to young fruit plantings.

The insecticides now used most extensively on apple, peach, pear, citrus, and nut crops are DDT, BHC, and Parathion. The first two are stable. It appears probable that DDT can accumulate almost indefinitely. Under present recommendations about 30 pounds per acre is applied annually. Evidence indicates that the 300 lbs. built up in a 10-year period will cause injury to peach seedlings in various types of soils. In sand cultures where the chemical was thoroughly mixed with the sand, as little as 25 to 30 pounds of DDT per acre, retarded the formation of the fibrous roots of peach seedlings. Up to 1,000 pounds per acre had a profound influence.

The accumulations of these insecticides do not influence the character of the growth of fruit, leaves, or wood of established trees. Goldsworthy and Foster report the use of as much as 3,000 pounds of DDT per acre without perceptible effect on the growth of trees or of sod flora. In these experiments, however, the chemical was applied to the surface of the soil only. It may not have come into contact with the roots.

Tests with BHC in several parts of this country and in England reveal the alarming tendency for this material to sterilize surface layers of soil. Certain plots in West Virginia where the chemical was used are now completely sterile of cover crop plants.

Because Parathion breaks down readily, there is no problem of accumulation in the soil. Tests show, however, that heavy applications of Parathion sprays to trees thin foliage of certain apple varieties and causes the fruit skin to russet in some varieties.

Crested Wheatgrass Strains Outpace Commercial Varieties

Improved grasses are in the making for the Northern Great Plains and Intermountain regions.

A strain of crested wheatgrass - No. 96-24 has outyielded selected strains from 11 sources in dry land farming tests at Logan, Utah, reports M.A. Hein (FC&D).

Production of this promising strain was 20 percent higher than the next best yielder and 71 percent above commercial seed used as a check. This lead was maintained when all strains under tests were grown in combination with alfalfa.

No. 96-24 was selected by G.A. Rogler about 10 years ago from an old crested wheatgrass planting at the Northern Great Plains Field Station, Mandan, N.Dak. It grows erect and is a good producer of seed as well as forage. Other new strains of crested wheatgrass developed more recently by what are considered more reliable procedures than straight selection indicate even greater superiority than 96-24. None of the new strains have been tested sufficiently for adaptation and other qualifications to permit their release to farmers and ranchers at this time.

Notes from the Peach Council

About 125 delegates to the ninth annual conference of the National Peach Council spent the day at Plant Industry Station, Feb. 21. Dr. F.P. Cullinan, assistant chief, welcomed the group and outlined the Bureau's activities at Beltsville and in the States. Highlights from talks on peach research were as follows:

We now have well recognized symptoms of nutrient deficiencies in peaches, Dr. Cullinan pointed out. That of potassium, first noted on Piedmont soils in South Carolina, is now recognized on other soils in different regions. Scattered orchards in Pennsylvania and New York show potash deficiency. Two minor elements, magnesium and manganese, are known to be deficient in a few orchards in the humid section. Experiments in solution culture show that nitrogen, phosphorus, potassium, calcium, manganese, sulfur, iron magnesium, boron, zinc, copper, and trace elements are needed for best growth.

Virus diseases now causing highest losses to the peach crop, according to Dr. J.R. Magness, are phony disease in the Southeast, mosaic in the Southwest, Western X in the Northwest, Eastern X and yellows (probably including little peach disease and red suture) in the Northeast. Identification of the large leaf hopper as the vector of phony peach disease is a definite advance in its control. All varieties in the Southeast appear susceptible to phony. Losses from this source are 60,000 to 100,000 trees annually.

Brown rot, which now costs about 6 million dollars annually, would be around 10 times that amount if the present sulfur sprays were not used, John C. Dunegan told the group. Present losses can be cut further by widespread use of multiple sprays during the blossom season. A possibility for reducing them even more lies in the development of a spray to eliminate mummies (rotted peaches) where the fungus overwinters. Zinc lime will control bacterial spot.

Most peach varieties in the Fort Valley, Ga., area require 1,000 hours at 45°F. or below before Feb. 15 to meet annual chilling requirements for normal fruiting, Dr. J. H. Weinberger reported. Last year, the warmest winter in 17 years resulted in irregular blooming and a delayed crop. Flower buds of the Mayflower variety, which requires 1,300 hours chilling, died in their scales. Under study, chemicals that might take the place of chilling have so far proved neither safe, effective, nor economical for general commercial use.

How best to supply nitrogen to get good yields, size, and color is a perennial question in the peach orchard. Reviewing recent findings, Dr. Leon Havis said it now appears that a proper practice must be worked out for each producing district, often for the particular orchard. A combined nitrogen-fertilizer and cover-crop test at Beltsville showed in 1949 that Elberta peaches from trees fertilized in early October were of much better color than those from trees fertilized in March and June.

Dr. Mark H. Haller pointed out that peaches do not need to be picked tree ripe to develop good quality. Pre-cooling and refrigeration in transit retard decay and ripening to about the same extent. However, refrigeration has made a longer marketing period possible. Results with the pressure test to distinguish mature peaches have been unsatisfactory. Summarizing observations of peach diseases on the Chicago market, Dr. Marion A. Smith stressed the importance of uniform cooling throughout carloads. He said delivery of sound peaches to the consumer is primarily a problem of disease control in the orchard.

Castor Beans Possible Replacement for Cotton and Peanuts

Seeking a crop to replace cotton and peanuts, farm leaders in Oklahoma, western Arkansas, and north Texas are showing considerable interest in castor beans, reports Dr. D. L. Van Horn (TM&SC), in charge of castor bean breeding studies at Stillwater, Okla. These are concerned with the breeding and selection of high-yielding, shatter-resistant varieties adapted to mechanical production.

Dr. Van Horn believes the crop has good possibilities in the area. Oklahoma is near the center of adaptation. Castor beans were grown on 95 farms in two counties of that State this past year. Yields ranged from 300 to 650 pounds of clean seed per acre on soils of low to medium fertility. The crop is handled mechanically except for harvesting. An experimental harvester is under study.

There is a demand for the oil, says Dr. Van Horn. It has a variety of uses. Only a small percentage goes into the manufacture of medicine. Most of it is used in varnishes, printing inks, oil cloth, linoleum, nylon fabrics, plastics, hydraulic brakes, and recoil mechanism fluids.

One commercial firm has indicated plans to contract approximately 25,000 acres of plantings this coming year. An interest has also been indicated in the establishment of processing plants in the area. In addition to the oil these would also provide pomace and hulls for use in fertilizer.

Conferences Suggest Minimums for Planning Low-Cost Farm Homes

Minimum requirements for use in developing low-cost farm home plans have been tentatively established in a series of 6 regional conferences. The meetings were called by Assistant Secretary K. T. Hutchinson as a preliminary step in the preparation of plans for low-cost farm houses under the Housing Act of 1949.

The proposed minimum requirements represent the thinking of agricultural engineers and home economists from the State experiment stations in each of the regions and of staff members from the State and Federal Extension Services, the Farmers Home Administration, and the Rural Electrification Administration.

The standards suggested are designed to make adequate provision for the farm family's health, comfort, and convenience at the lowest possible costs. They cover all phases of planning the new farm home from choice of site to standards for kitchen cupboard space.

While basically the same for all regions, the proposed requirements are varied to meet local problems. For example, in the South it was agreed that frame walls without sheathing would be acceptable but provision should be made for porches. In the Southwest adobe of a specified thickness was used in the construction of low-cost farm homes listed as permissible.

The plans will be developed at Beltsville and at cooperative State colleges in each region. Many of the plans will be designed especially for use by farmers eligible for loans.

Briefs from Recent Meetings

First step in a move to revamp and strengthen USDA and cooperating State and industry research in cotton was taken at a conference in Biloxi, Miss., in February. With representatives from other Department agencies, the National Cotton Council, and 14 States, Bureau workers reviewed and evaluated present research and suggested future investigations in genetics and breeding, nutrition, culture, and biochemistry, diseases, biological influence on fiber properties, and one-variety cotton communities. Reports of the meeting are now being circulated to each member who attended for supplementary material and further suggestions.

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Maintenance of fertility and better use of water are the chief soil management problems of the humid South, Dr. R. Q. Parks (SMI) told the Southern Agricultural Workers at Biloxi. He said research is needed to find answers to these questions:

(1) What are favorable levels of available soil phosphorus for different crops and soils? Southern farmers apply an average of 3-1/2 times as much phosphorus in fertilizers as is removed in crops. Might it be more economical to apply the phosphorus all at one time than in small amounts over a period of 25 to 125 years?

(2) To what extent can deep-rooted legumes be used to improve soils?

(3) At what rate is native potash released? Can this be modified?

(4) To what extent are minor elements available in the soils?

(5) What are the potential sources of water within economic reach for supplemental irrigation?

(6) What are agricultural potentialities of supplemental irrigation in areas near good water supplies?

(7) How much can a combination of good management practices--use of improved varieties and high fertilization--decrease erosion?

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Cotton defoliation of both hand and machine harvested cotton has proved highly beneficial and is now practiced widely. Progress with methods reflects credit upon BPISAE and particularly Dr. W. H. Tharp (C&OFC&D), leader in this research since it was started. Cotton Defoliation Workers at Memphis, Tenn., January 12-13.

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Fluorescent lamps radiating in the near ultraviolet or "black light" range attract female corn borer moths to be killed on electric grids below the lamps--which has directed attention to lamps as an auxiliary in corn borer control. There is, however, potential danger in the over promotion of light traps until they are improved and the limitations better understood. Conference of manufacturer's representatives and USDA in Washington, January 27.

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Among advances in sugar beet breeding reported at the American Society of Sugar Beet Technologists in Detroit February 9 are: (1) A new variety resistant to black root and leaf spot for the humid beet areas. Seed will be available in 1951; (2) search is being made for strains of beets that keep better in storage piles at the factory; (3) a new sugar beet from a cross between red garden beets and sugar beets that has a good sugar content and a root shape for easy harvesting by machine; (4) sugar beets that do not produce pollen. These can be planted with pollen-producing beets to grow a seed crop 100 percent hybrid.

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Digest of Information on Potato Handling and Storage

Just off the press is U.S.D.A. Bibliographical Bulletin No. 11, "Handling, Storage, Transportation, and Utilization of Potatoes: A digest of information on the subject published mostly from 1938 to 1948," by Dean H. Rose and Harold T. Cook. This 163-page review of recent literature was made under the Research and Marketing Act of 1946 and is the first in a series intended to cover the biology and physical handling of important horticultural crops during the marketing period. Similar digests are in preparation for tomatoes, peaches, and citrus fruits.

Starting with potato digging, the various sections of the present bulletin present recent findings on all the various operations to which potatoes are subjected, leading up to the ultimate discussion of cooking quality, and of processing and byproducts. Also included is information about consumer and market preferences, transit and storage diseases, insect damage, and nematodes. The comprehensiveness of this digest makes it a "must" for anyone engaged in any phase of potato investigation. Its thoroughness and excellence of presentation set high standards for future publications of this sort.

Moseman on Round-the-World Mission

Dr. Albert H. Moseman is one of three USDA technical experts on a mission that will take them into 12 Eastern Hemisphere countries seeking U. S. cooperation in programs of agricultural improvement. With Dr. Moseman, who represents the Agricultural Research Administration, are Paul V. Kepner, Extension Service, and Dr. Ross E. Moore, Office of Foreign Agricultural Relations.

Countries to be visited during the 80-day trip include Egypt, Syria, Lebanon, Iran, Iraq, India, Pakistan, Afghanistan, Ceylon, Burma, Thailand, and the Philippines.

The mission will assist American embassies in negotiating written agreements on agricultural technical cooperation with funds available under Public Law 402. The work is similar to that envisioned on a larger scale by the proposed Point IV program.

Specific projects are under discussion. Among these are improvements in food crops, control of plant diseases, further development of extension work, the establishment of crop reporting systems, and advances in farm management and marketing system.

First Varieties of the Fifties

Azaleas - 10 varieties from the breeding program initiated about 10 years ago by the late Guy E. Yerkes and continued by R. L. Pryor. They have been named Yerkes, Hume (for Dr. H. H. Hume of the Florida Experiment Station), Polar Bear, Pink Profusion, Rose Banner, White Banner, Rose Glory, White Perfection, and Snowwhite. The blossoms are the hose-in-hose type, a double flower in which one corolla appears to be within another. They are widely adapted and can be grown in acid soils from New England to the West Coast.

Daylilies - 16 clons selected by Dr. H. P. Traub and Dr. S. L. Emsweller from more than 12,000 Hemerocallis seedlings. The new varieties will be available from nurserymen in two or three years under the names Mary Henry, Golden Triangle, Emily Dickinson, Calrinda, Lemon Tulip, Iowa, Krishna, Papagaio, Stephen Foster, Saffron Queen, Mitra, Reinbeck, Susanna, Purity, Anna Zenger, and Gita. They give a wide range in time of blooming, form of flower, and color.

Snapdragons - three tetraploid varieties developed at Plant Industry Station in breeding work by Dr. Thomas Little and R. L. Pryor. Deep Salmon Pink is somewhat like the diploid variety, Apple Blossom, but has larger flowers and heavier spikes. Bright Rose is a medium pink with very large flowers. White Rose is a medium pink with heavy stems and close tight spikes of large flowers.

Perennial Phlox - a race selected by R. L. Pryor has been named Beltsville Beauty. It includes whites, whites with salmon eyes, pinks of various shades, reds, maroons, and salmons. Seed, planted outdoors in the fall, germinate after exposure to low temperatures. Seedlings appear early in the spring and are then transplanted to permanent quarters where they will flower the first year.

Blackberry - Olallie, a new trailing variety with attractive bright black fruit. A 1937 selection from a cross between Black Logan and Young, the new berry is the result of small-fruit breeding investigations carried on by G. F. Waldo in cooperation with the Oregon Agricultural Experiment Station. The new variety is suggested for trial in all parts of California and in western Oregon.

Cranberries - three new varieties--Stevens, Wilcox, and Beckwith--the first ever to have resulted from fruit breeding work. All are productive and have larger berries than the principal commercial varieties of New Jersey and Massachusetts. The Wilcox shows high resistance to feeding by leafhopper, the insect that spreads the false blossom virus. Berries of the Stevens have unusually good gloss and color and are resistant to breakdown. Its vigorous vines do especially well on thin bogs and it has shown promise in Wisconsin. Berries of the Beckwith are borne high on long uprights. This makes them easy to harvest by scooping. The Beckwith rated highest in flavor tests of sauce made from new and well-known varieties. The new varieties come from crosses made about 20 years ago by H. F. Bain and H. F. Bergman. The original selections were made from 1938 to 1940 by Mr. Bain and the late R. B. Wilcox with the help of growers and associates. The new berries have been named for plant scientists whose studies have contributed to the improvement of the crop--Mr. Wilcox, for many years at Pemberton, N. J.; the late Neil Stevens, former head of the botany department at the University of Illinois and at one time in charge of berry disease research in USDA; and the late Charles S. Beckwith, entomologist of the New Jersey Experiment Station, who cooperated in the early breeding work.

Grape - Calmeria, a highly productive, shipping and storage grape for California. The fruit is larger and of somewhat sweeter flavor than Ohanez (Almeria) the well-known, mid-winter storage variety, which Calmeria is expected to replace. Like the Ohanez, the Calmeria grape is greenish yellow with a light gray bloom. The new variety is a seedling of Ohanez, selected by Elmer Snyder and associate plant scientists at the Fresno Field Station.

Tung nut - Lampton, a high yielding, early maturing variety with high kernel percentage and oil content. The selection and testing have been carried on by Dr. M. S. Neff, E. N. O'Rourke, Jr., and others of the tung investigations staff.

Barley - Bonneville, a spring barley with stiff straw, club heads, smooth awns, has been released this spring in Oregon and Utah for registered seed production. Specially adapted to fertile irrigated lands in sections where the season is fairly long, it has produced the highest yields of any barleys ever tested in Utah. Bonneville was selected and tested by Dr. R. W. Woodward (CC&D) located at the Utah Experiment Station.

New Light on Tung Leaf Enzymes

Dr. S. G. Gilbert of the Gainesville (Fla.) tung investigation laboratory is studying the effect of trace-element deficiencies on the enzyme system of the leaves. He reports that:

1. Leaves of magnesium-deficient tung trees are low in oxidase activity, high in peroxidase activity compared with leaves from normal trees or from deficient ones treated with magnesium.
2. Leaves from manganese-deficient or zinc-deficient trees show reduction in both oxidase and peroxidase activity.

Filtration properties of the partially purified peroxidase enzyme indicate a molecular weight relatively low for a protein. The seat of this enzyme appears to be in the chloroplasts--it shows up when they are isolated from the leaf. However, areas lacking chlorophyll in variegated leaves have much higher peroxidase activity than the adjacent green portions. To explain this, Dr. Gilbert reasons that hematin (iron-containing compound) is synthesized when a deficiency of magnesium hinders the formation of normal chlorophyll. Peroxidase probably contains a hematin prosthetic group, and when hematin is formed, production of this enzyme is increased.

Ware to Assignment in Arkansas

New headquarters for Dr. J. O. Ware (C&OFC&D) are in Fayetteville, Ark., where he is heading up an enlarged cooperative cotton breeding and genetics program in cooperation with the State Experiment Station. Dr. Ware came to Washington in 1935 from the Arkansas Station.

Ryall to California

A. Lloyd Ryall (F&VC&D), in charge of the handling, transportation, and storage laboratory at Harlingen, Texas, since 1943, has assumed charge of the laboratory at Fresno, Calif. He succeeds W. T. Pentzer, now leader of the section at Plant Industry Station.

Advances in Research with Plant Growth Regulators

New uses indicated for plant growth regulators in recent research findings by various experimenters at Beltsville and elsewhere were reviewed by Dr. J. W. Mitchell and Dr. Paul C. Marth (F&VC&D) in a seminar at Plant Industry Station January 18. Among these are:

1. Increasing yields in field-grown tomatoes and snapbeans by sprays that reduce blossom shedding.
2. Prolonging the storage quality of snapbeans by preharvest sprays. Treated fruits retain vitamin C content longer than those untreated and do not shrivel so quickly.
3. Prolonging the storage quality of cauliflower. The leaves remain attached from 2 to 3 weeks longer on heads sprayed with a growth regulator.
4. Speeding up the ripening of certain varieties of apples and peaches on the tree from 1 to 4 weeks by treatment with growth regulators.
5. Hastening the uniform ripening of harvested fruit--bananas, pears, peaches, apples, figs, and green-pack tomatoes.
6. Reducing premature drop in citrus fruits and improving the storage qualities of lemons.
7. Reducing sprouting in cull piles of potatoes. This shows promise as a control for treating possible sources of blight infection.
8. Prolonging the blossom season of ornamental cherry trees.
9. Aiding the plant breeder in making crosses in certain species at Beltsville, growth regulating substance has been used as an aid in lily breeding.

Investigations of basic plant responses indicate that growth regulators:

1. Accelerate respiration except in seedlings. In a study with bean plants, Mitchell and Marth note that the increased respiration in treated plants continued two days, dropped rapidly, and then became much slower.
2. Do not appear to stimulate photosynthesis. Few experiments are reported on this phase of the work.
3. Apparently accelerate activity of enzymes.
4. Stimulate the accumulation of the simpler forms of carbohydrates; however, one chemical applied to beans resulted in an accumulation of the higher forms and a depletion of the simpler forms.
5. Are most quickly absorbed in prime leaves and young succulent part of the stem. Uptake of growth regulators will continue at a fair rate for at least 4 days and probably longer in bean plants.
6. Increase ability of bean plants to retain water. This may be the result of fundamental changes in proteins or of change in osmotic pressure.
7. Can be forced into the roots of the plant through the application of an adjuvant to the leaf. The commercial adjuvant Tween-20 is one of the best for this treatment.

Forage Specialists Elected

Will Myers, head of the forage division, and C. S. Garrison, in charge of the legume and grass foundation seed program, are officers in the International Crop Improvement Association. Myers was elected to the council for a 2-year term and Garrison was reelected secretary when the Association met in Kansas City, Mo., in December.

The American Society of Range Management has named David Savage, U. S. Southern Great Plains Field Station, Woodward, Okla., president, and E. H. McIlvain, Jr., also of the Woodward Station, secretary.

Biometry Unit Aids in Statistical Analyses

Are your statistics showing? One of the more common faults in scientific writing, says Dr. David D. Mason, Bureau biometrician, is an over-emphasis on statistical terms. Use statistics, he advises, to bring out the meat of the study, but don't make them obvious.

The biometrical unit, which Dr. Mason heads, was set up as a part of the Chief's office this past year to meet three objectives:

1. Furnish statistical assistance to Bureau research workers.
2. Conduct research in applied statistics used in experimental design.
3. Keep abreast of the developments in statistics.

Service of the unit to scientific workers begins with aid in selecting an experimental design that gives the most information per unit cost. After the design is chosen, Dr. Mason and his assistant, James Koch, will also help the researcher write out a skeleton statistical analysis to be used as a proof for comparison.

With only one computer (Miss Elsie Burke) on the staff, it is necessary to limit computation services to problems (1) that can be used as illustrative examples, and (2) those needed for advance sampling. As Dr. Mason and Mr. Koch are able to assist more with statistical planning, less time will be required for the review of manuscripts in the final stages of publication and the checking of procedures.

The work of the unit was described and recent developments in applied statistics were outlined by Dr. Mason in a seminar at Plant Industry Station in January. He says a book "Experimental Design" by Cochran and Cox, off the press this month, will be helpful to Bureau workers interested in this field.

Shelled Corn Storage Studies

At the request of the Commodity Credit Corporation, the Division of Farm Buildings and Rural Housing is cooperating with BE&PQ and the Grain Branch, PMA, in studies to determine changes occurring in the condition of shelled corn stored in bins of more than 3,000 bushels capacity. Many of the thousands of bins bought by CCC in 1949 under the expanded storage program range in capacity from 3,200 to 61,000 bushels. How well grain will store in these large bulks without the moving practiced in commercial elevators is not known. Five areas in the Grain Belt, representing major differences in climatic conditions, have been selected to study handling and conditioning of shelled corn.

The agricultural engineers will supervise the installation of ventilation equipment at three or four storage sites in each area. Two to five of the buildings at each site will be equipped with different systems of air ducts, and one or more movable blowers will be used at each site for experiments in ventilating the grain. These will provide data on several rates of air flow, application of air by pressure and by suction, and use of heated and unheated air.

At one bin site near Ames, Iowa, equipment will measure the pressures developed by the bulk of grain against the bin walls. Robert A. Saul has been appointed to handle this phase of the investigations. Other new FB&RH staff members appointed for this cooperative program are Robert H. Eagleton, Urbana, Ill.; Hajime Ota, Redwood Falls, Minn.; Joel A. Wentz, Manhattan, Kans.; Loren S. Elliott, Ames, Iowa; and Robert N. Robinson, Lafayette, Ind.

Branch Libraries Aid Bureau Workers

A large number of Bureau employees were among USDA field workers who borrowed more than 900 thousand books, periodicals, and photostats and used the reference services and other aids at field locations of the USDA library during the past fiscal year.

For the information of new employees and other Bureau workers who would like library assistance, there are eight branch libraries, conveniently located to serve USDA field workers in all parts of the country.

Employees at the Agricultural Research Center use the branch Library in the administration building at Plant Industry Station. Mrs. Lela Caswell is librarian.

USDA workers in the Northeast are served by the branch library in the Bankers Securities Building, Philadelphia, where Miss Sara Parker is librarian.

Widest circulation of any branch library for the past fiscal year was reported by Miss Frances Beckwith, librarian of the branch in the Forest Products Laboratory at Madison. This one provides service to USDA workers in Wisconsin, Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, and Ohio.

The branch library, 920 Glenn Building, Atlanta, serves Georgia, Alabama, Florida, Virginia, North Carolina, South Carolina, Kentucky, Tennessee, Mississippi, and Puerto Rico. Mrs. Clemie Shirley is librarian.

USDA workers in Arkansas, Louisiana, Oklahoma, and Texas are served by the branch library, 1018 Federal Office Building, New Orleans. Miss Helen Boyd is librarian.

The branch in the Rudge and Guenzel Building, Lincoln, serves Nebraska, Kansas, Montana, North Dakota, South Dakota, and Wyoming. Librarian is Miss Marie Gould.

Bureau and other USDA workers in the Southwest can obtain library assistance from Mrs. Marion Dorrah, librarian of the Albuquerque branch (Box 1348).

The services of the San Francisco branch library, 626 Appraisers Building, 630 Sansome St., are available to field workers in California, Idaho, Nevada, Oregon, Washington, and Alaska. Miss Signe Ruh Ottersen is librarian.

Newsletters listing recent books and periodicals are available from each of the branches except Beltsville. The libraries also carry loan copies of the monthly Bibliography of Agriculture.

Correction

In the December issue of Research Activities, Dr. E. A. Hollowell was quoted as suggesting that legume breeders should consider possibilities of species such as Trifolium dacyphyllum occurring most commonly at high altitudes in the Rockies. Instead he said, "Certain characteristics of many native and less important exotic species may prove to be useful in such a program. Many native species of extreme form such as Trifolium dacyphyllum seem to have little to offer in developing new legumes."

 * NOTES ON PERSONNEL *

RETIREMENTS

Walter A. Barnes, agricultural aid (F&VC&D), January 31, after more than 25 years service.

Gordon Marcey, mechanic, Plant Industry Station, January 31, after more than 40 years service.

DEATHS

Clarence A. Reed, 69, died January 15 in Lakeland, Fla. Joining the Bureau in 1907, Mr. Reed specialized in the development of pecan and filbert nuts. His research in improving the varieties, cultural and disease control practices led to Congressional appropriations establishing pecan experiment stations in many parts of the South. He developed two varieties of filberts from crosses of American and European species. In 1922, he was sent to China to find new varieties of the English walnut.

Before retiring in 1947, Mr. Reed had written many bulletins and papers dealing with nut culture. His articles on this subject have been used in the Encyclopedia Britannica.

Born in Howell, Mich., he was graduated from Michigan State College in 1905. He received his masters degree in horticulture from that institution in 1913. Mr. Reed was first employed by a firm of landscape architects in Chicago. He served in the horticultural department of Maryland State College, now the University of Maryland, and the West Virginia Agricultural Experiment Station before coming to the Department of Agriculture.

He leaves his widow, Mrs. Katherine McNaughton Reed, 7309 Piney Branch Road, N.W., and a daughter, Mrs. Harris Richardson, 20 Chesapeake St., S. E., Washington, D. C.

New Numbers in Engineering Information Series

IS-95 - a bibliography on spraying and dusting equipment. Compiled from the USDA library bibliography of agriculture for the period from February 1942 through April 1949.

IS-96 - a list of current research projects of USDA and State experiment stations on application equipment for crop and animal pesticides, plant growth regulators, defoliants, plant nutrients (above ground), and soil fumigants.

IS-97 - the first annual report of research accomplishments in farm machinery and equipment by public research agencies, the State agricultural experiment stations, and USDA.

 * PUBLICATIONS *

Recent Bureau Press Releases

Copies of the following releases may be obtained from Press Service,
 Office of Information, U. S. Department of Agriculture, Washington 25, D. C.

<u>Date</u>	<u>Subject</u>
January 6	Martin G. Weiss heads soybean research in U. S. Department of Agriculture - USDA 41-50
January 6	Pigs' reactions to temperature changes shown in California research - USDA 48-50
January 11	Walcott and Murphy, new blueberry varieties for North Carolina - USDA 82-50
January 13	Research is providing cottons high in fiber strength - USDA 115-50
January 13	Three new disease-resistant tobaccos announced by USDA and N.C. Station - USDA 114-50
January 13	To control brown rot in peach orchard, spray during blossom stage - USDA 111-50
January 20	Legume-inoculation man gives South some crop tips - USDA 186-50
January 24	DDT may not affect seed germination, USDA study shows - USDA 212-50
January 26	Good progress reported in foundation legume seed program - USDA 235-50
January 27	Three new snapdragon varieties released by U.S.D.A. - USDA 248-50
January 29	Growth regulator ripens apples on the tree - C.S. 99-50
January 30	Methyl bromide gets cotton weed 2,4-D didn't - USDA 265-50
January 30	Perennial phlox developed at USDA Plant Industry Station - USDA 264-50
January 31	New cotton cleaning device developed by USDA engineers - USDA 273-50
January 31	USDA plant scientists report evidence of a new oat disease - 275-50
February 1	Pathologists use planes to spot pole blight of pines - USDA 289-50
February 3	Apple scab can be controlled more easily, says USDA scientist - USDA 312-50
February 7	Ten new azaleas introduced by USDA floriculturists - USDA 346-50
February 7	Better sugar beets and methods reported by scientists at Detroit meeting - USDA 342-50
February 12	Science schemes against tree-choking mistletoe - C.S. 236-50
February 15	Sugar beets can have too much room for own good - Ext. release USDA 436-50
February 16	USDA pathologists look for fungus carrier in new oak disease - USDA 427-50
February 16	New cranberry varieties announced by experiment stations and USDA - USDA 420-50
February 21	Calmaria, new storage grape, developed by USDA - USDA 456-50
February 21	New blackberry variety is adapted to Pacific Coast - USDA 457-50
February 27	Humus better known as result of new studies by USDA investigations - USDA 502-50
March 1	USDA recommends farmers generally sow same oat varieties this year as last - USDA 521-50
March 5	A bit of cobalt plus a billion bits of water - C.S. 425-50

Radio Broadcasts by Bureau Scientists

- January 14 - "Renewed attack on an old peach disease," John C. Dunegan (F&VC&D) in the National Farm and Home Hour over the National Broadcasting Company network.
- January 23 - "Use good practices in combination," Dr. Robert M. Salter, chief of the Bureau.
"Recent developments in vegetable crop production," Dr. V. R. Boswell (F&VC&D)
"Research with plant growth regulators," Dr. John W. Mitchell (F&VC&D)
Five-minute transcriptions for use on the farm program of the Australian Broadcasting Company.
- February 4 - "Latest tactics against apple scab," John C. Dunegan in the National Farm and Home Hour over the National Broadcasting Company network.
- February 11 - "As we turn to more grass," C. S. Garrison (FC&D) in the American Farmer over the American Broadcasting Company network.
- February 14 - "Cotton gains through plant breeding," two 3-minute transcriptions by Dr. C. R. Sayre (C&OFC&D) for Textile Topics distributed by J. W. Valentine Co., Inc.
- February 18 - "New varieties of fruits and vegetables," by Dr. F. P. Cullinan, assistant chief of the Bureau, for the network farm show of the Columbia Broadcasting System.

Departmental Publications

- Technical Bulletin 998 - Partitioning method of genetic analysis applied to quantitative characters of tomato crosses
- Technical Bulletin 999 - A study of the quality of abaca fiber
- Technical Bulletin 1003 - Evaluation of indexes of maturity for apples
- Circular 832 - Cooperative studies on the effects of height of ridge, nitrogen supply, and time of harvest on yield and flesh color of the Porto Rico sweetpotato
- Bibliographical Bulletin No. 11 - Handling, storage, transportation, and utilization of potatoes
- Plant Inventory No. 138 - Introductions, January 1-March 31, 1939.
- Soil Survey Report of Cheshire and Sullivan Counties, New Hampshire
- Soil Survey Report of Rock County, Minnesota.

Recent Articles in Outside Publications

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- Barger, W. R., and Whiteman, T. M. Waxing new potatoes. *The Bakersfield Californian*, July 1949.
- Boswell, V. R. Federal research on vegetables in the South. *Fla. State Hort. Soc. Proc.* 1948.
- Boswell, V. R. Public-private team work in introducing new varieties. *Amer. Seed Trade Assoc. Yearbook*, 1949.
- Brierley, P. Eradicant fungicides of possible value against the azalea petal blight fungus, *Ovulinia azaleae*, *Phytopathology*, February 1950.
- Campbell, J. A., and Hoffman, J. C. Contender, a new fresh market snap bean. *Seed World*, Jan. 20, 1950.
- Carpenter, J. B. Production and discharge of basidiospores by Pellicularia filamentosa (Pat.) Rogers on *Hevea* rubber. *Phytopathology* 39, December 1949.
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